00002653

EG&G ROCKY FLATS

INTEROFFICE CORRESPONDENCE

DATE: September 20, 1994

TO: S. M. Nesta, Ecology and National Environmental Policy Act Division, Bldg. T130J, X6386

FROM: C. J. Dodge, Field Operations, Bldg. 080, X8536

SUBJECT: ENVIRONMENTAL MANAGEMENT PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT AFFECTED ENVIRONMENT SECTION - DETAILED INSTALLATION DESCRIPTION FOR ROCKY FLATS PLANT - CJD-017-94

DOE Order: 5480.4

Action: None

Ref: C. J. Dodge ltr, CJD-005-94, to S. M. Nesta, Same Subject, February 2, 1994

In response to your request, I am submitting review comments relative to the "Geology" and "Groundwater" sections of the above referenced document. These review comments were supplied to Dave Ussery on September 7, 1994.

An initial draft of the document under review was evaluated by "Geosciences" earlier this year. Tim Lovseth provided guidance in a Memorandum dated January 31, 1994; and I provided substantial review comments in Interoffice Correspondence dated February 2, 1994 (CJD 005-94). Although the current draft document is much improved from the original, much of the guidance provided by myself and Mr. Lovseth was not utilized. Both Tim and I recommended that the preparers utilize certain reference documents; this was not done. Much of my specific guidance was not employed, as this second-draft document contains some of the same errors that were in the initial draft. I highly recommend that the subcontractor preparing this document be required to accept the accountability of their work by responding on the official "Document Review Forms" which you provide for them.
The following comments were provided to Dave Ussery. His staff transferred them onto a "Document Review Form" and forwarded them appropriately.

Page E.2.12-7; Line 18: This sentence is poorly written and ambiguous.

Page E.2.12-8; Lines 20-23: The definition of the Arapahoe Formation at RFP is not current. This issue was previously corrected. Please refer to the Interoffice Correspondence referenced above.

Page E.2.12-8 and E.2.12-9; Lines 27 through 3: The use of "next youngest" is awkward. The verb tense "is" (line 27) does not agree with "deposits" (line 1). The RFP industrial area is situated on the Rocky Flats Alluvium, where the thickness of surficial deposits ranges form 5 to 40 feet.

Page E.2.12-9; Lines 4 through 12: This discussion of the Golden Fault is not current. New interpretations utilizing seismic indicate that the Golden Fault (if it extends northward from Golden into the general area of the RFP) is not exposed at the surface. The faulting style is not high-angle and normal.

For background information, the following discussion is provided. This material will be included in the EG&G 1994 Sitewide Geologic Characterization Report, currently being prepared. Most of this information is presented in the following reference: EG&G, 1993, Phase II Geologic Characterization - Data Acquisition, Task 2 Deep Seismic, Department of Energy, Rocky Flats Plant, November 1993. This is one of the references we recommended to the preparers last February.

Recent investigations of Laramide tectonic structures of the Front Range have indicated that Laramide uplifts and bounding thrust faults are the result of compressional forces. As part of the Geologic Characterization Data Acquisition program, a seismic reflection survey was conducted to provide information on Rocky Flats geologic structures and features between depths of 500 and 12,000 feet (EG&G, 1993?). The processed seismic data revealed the presence of a major west-dipping mountain-front thrust fault with approximately 5,000 feet of displacement. This fault originates in the Precambrian basement, cuts the sedimentary section from the Fountain Formation through the Niobrara Formation, and becomes a sole bedding plane fault within the Niobrara Formation. Blind imbricate thrust faults and associated backthrusts originate on the sole thrust and extend through the Pierre Shale. The upward extent of these faults is still under investigation.

Current (1994) Geologic Characterization activities have revealed the existence of shallow faults, which are being evaluated relative to potential seismic risk.

Section E.2.12.2.2. Groundwater

This section uses the term "aquifer" very loosely. By definition, an aquifer should yield economic quantities of water. Neither the Surficial deposits nor the Arapahoe Formation underlying the RAP meet this definition. Therefore, we commonly refer to the Alluvial deposits and the subcropping Arapahoe Formation as the "Uppermost Hydrostratigraphic Unit".

Page E.2.12-15; Lines 22 through 26

This section refers to the Arapahoe Formation as a source of drinking water for the city of

Denver and surrounding areas. The Arapahoe Formation sandstones underlying the RFP are thin and lenticular. The thickness of the Arapahoe Formation, where it is present, is commonly less than 50 feet. Arapahoe Sandstones underlaying the central industrial area of the RFP pediment surface are breached by stream erosion. Therefore it does not appear that groundwaters in the Arapahoe Sandstones have the potential of migrating offsite.

Page E.2.12-16; Line 5

Change: 200 feet to 400 to 500 ft of relatively impermeable shale.

Page E.2.12-16; Lines 10 through 15

At the end of the second quarter of 1994 there were 518 RFP monitoring wells. Of these 380 were being sampled quarterly.

CJD:bk

Attachment:
As Stated

cc:
L. A. Gregory-Frost
T. P. Lovseth
ERPD Project File (2)

10

EG&G ROCKY FLATS

INTEROFFICE CORRESPONDENCE

DATE: February 2, 1994

TO: M. M. Nesta, Ecology and National Env Policy Act Division, Bldg. T130J, X6386

FROM: C. J. Dodge, GeoSciences, Bldg. 080, X8536

SUBJECT: ENVIRONMENTAL MANAGEMENT PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT AFFECTED ENVIRONMENT SECTION - DETAILED INSTALLATION DESCRIPTION FOR ROCKY FLATS PLANT - CJD-005-94

In response to your request, I am submitting review comments for the above referenced document. It is my recommendation that the section on geology and hydrogeology be rewritten by a geologist/hydrogeologist so that the document contains appropriate, updated, and accurate interpretations. In addition, technical errors need to be addressed, and the document clarity and precision should be improved.

Two technical matter experts from the Geosciences Department, Tim Lovseth and myself, are providing response comments. Tim and I agree that this portion of the document needs to be rewritten and that up-to-date references should be utilized. Tim conveyed a list of appropriate references in a memorandum dated January 3, 1994.

I am providing a document comment sheet, listing some of the technical issues which need to be addressed. Also I have attached a rewrite of the introductory paragraphs for the "Geologic Elements" section. If you have any questions or concerns, please feel free to contact me at extension 8536.

CJD:bll

cc:
C. A. Bicher

1.12.3.1 Geologic Elements

RFP is situated at an elevation of approximately 1,830 m (6,000 feet) on a gently sloping, incised, mountain-front pediment. The pediment flanks the eastern edge of the abruptly rising Front Range of the Rocky Mountains and slopes gradually at a grade of approximately 29 meters per km (95 feet per mile).

Surficial deposits of RFP are generally less than 15 m (50 feet) thick and consist of terrace alluvium, colluvium, and valley fill. Terrace alluvium is the dominant bedrock cover and is described in more detail below. Colluvial deposits consist of displaced alluvial and bedrock materials, including small slumps which are common on oversteepened slopes along banks of creeks and ponds. Valley fill deposits consist of early Recent to late Recent channel and terrace deposits along the streams dissecting the Rocky Flats pediment. Surficial deposit lithologies include clay, silt, sand, gravel, cobbles, and boulders.

RFP is situated on the Rocky Flats Alluvium, a pediment cover varying in thickness from zero to 100 feet, and artificial fill materials. The Rocky Flats Alluvium, an alluvial fan deposit with its apex near the mouth of Coal Creek Canyon, consists of relatively permeable gravels, sands and clays. These surficial deposits unconformably overlie Cretaceous bedrock, consisting primarily of claystones and siltstones. Due to the permeability contrast, springs and seeps are common at the base of the alluvial / bedrock contact. .....

DOCUMENT COMMENT SHEET

DOCUMENT NO. Draft REVIEW TYPE: I Page 1 of 5

DOCUMENT TITLE: Environmental Management Programmatic Environmental Impact Statement Affected Environment Section

Tracking No.

RESPONSIBLE ENGINEER: Dave Ussery X4101

Date: January 20, 1994

REVIEWER'S NAME: Constance J. Dodge Other

RETURN YOUR COMMENTS TO D. Ussery, BLDG T130J, BY January 27, 1994

REVIEWER'S SIGNATURE: Date:

Item No.	Page/ Para.	Comment	Accept	Reject	Concurrence	Action Required	Date Closed
1.		As mentioned in the cover letter, the geologic and hydrogeologic sections of this document need to be rewritten so that the document contains appropriate, accurate, and up-to-date interpretations. A suggested rewrite of the first three paragraphs is attached. Listed below are several of the technical flaws that need to be addressed.					
2.	page 335, lines 1-2	It is stated that the potentials for landslides and subsidence are not considered likely. This is not true. Actually the potential for small landslides due to slumping along the stream valleys is quite high.					

DOCUMENT COMMENT SHEET

TRACKING NO.

Item No.	Page/ Para.	Comment	Accept	Reject	Concurrence	Action Required	Date Closed
3.	page 335 lines 3-22 and page 336 lines 1-18	This section is poorly written, and the point in unclear. A better description of the stratigraphy is provided in the Phase II Geologic Characterization Data Acquisition report of March, 1992. This section should be rewritten and condensed. On page 335, lines 3-4, it is stated that the geologic framework directly affects the movement of surface water. How is this true?					
4.	page 336, lines 5-17	This section pertaining to the thickness of the Laramie and Arapahoe Formations is not up-to-date. In the 1991 Geologic Characterization Report for RFP, the Arapahoe Formation is considered to be 150 feet thick beneath the central portion of the plant. However the position of the Arapahoe Formation - Laramie Formation contact					

DOCUMENT COMMENT SHEET

TRACKING NO.

Item No.	Page/ Para.	Comment	Accept	Reject	Concurrence	Action Required	Date Closed
		is being evaluated. More recent work suggests that the Arapahoe Formation is only present locally under the RFP, an where it is present it is less than 50 feet thick. Also, the Arapahoe Formation, if present at all, is composed dominantly of fluvial sandstones.					
5.	page 336, lines 18-23 and page 337, lines 1-5	For any discussion relative to the structural geology, the author is referred to a recently completed CSU MS thesis. This work, which was conducted by Bjorn Selvig, was funded by EG&G. (The title of this work has been provided in a memo by Tim Loveseth.)					
6.	page 337, lines 6-18	In this discussion, the location of gravel mining, as well as other commercial operations immediately upgradient of the RFP is unclear. These are important to note, because they have the potential of effecting the upgradient water quality.					

DOCUMENT COMMENT SHEET

TRACKING NO.

Item No.	Page/ Para.	Comment	Accept	Reject	Concurrence	Action Required	Date Closed
7.	Page 337 -- Section on soil elements	The document states that soil types at RFP have not been mapped by the U.S. Soil Conservation Service. Soil types at RFP have been mapped, and soil characterization studies are being conducted. The appropriate contact person for this information is Jim Whiting of Geosciences at extension 8799.					
8.	Section 1.12.4 WATER RESOURCES AND SYSTEMS	This entire section needs to be completely rewritten by a hydrogeologist using up-to-date resources. The introduction of this section appears to be a conglomeration of disconnected statements. What is the point? The section on groundwater should be rewritten so that it includes current interpretations, flows logically, and makes the appropriate key points. Listed below are a few of the flaws in this potion of the document.					

TRACKING NO.

Item No.	Page/ Para.	Accept	Reject	Concurrence	Action Required	Date Closed

statement that the infiltration rate is high and has been reported at rates of up to 6 inches per hour. This statement may be true, but it certainly gives the reader the wrong picture about recharge to the groundwater system. The statement implies that the groundwater recharge rate is high; however, because of limited precipitation, the recharge rate to the uppermost hydrostratigraphic unit is actually only inches per year.

10. Page 342 -- Line 16 The statement that "groundwater flow in the area is controlled by buried channels in the bedrock where the alluvium is thickest." is ambiguous. Buried paleochannels in the bedrock have nothing to do with alluvial thickness. Paleochannels at the base of the alluvium are related to alluvial thickness. In addition, the role of buried channels is overstated.

11. Page 343 -- Lines 19-24 For a basis of comparison, it is more appropriate to refer the hydraulic conductivities of the alluvial materials rather than their pore velocities

12. Page 345 -- Line 5 The values given for hydraulic conductivities may be off by approximately two orders of magnitude, depending upon the lithology. It is very important that when this is rewritten, up-to-date values are given, and the lithologies associated with each value be provided. Updated definitions of the Arapahoe and Laramie Formations need to be considered when the groundwater section is rewritten.